

Island County Comprehensive Plan

2. Water Resources Element



*Katie Hall
1st Grade
Coupeville Elementary*

**Adopted
September 28, 1998**

TABLE OF CONTENTS

ISLAND COUNTY WATER RESOURCES ELEMENT	3
INTRODUCTION	3
WATER SUPPLY AND WATER RESOURCE MANAGEMENT REQUIREMENTS AND ACTIVITIES	4
<i>Water Supply Overview</i>	4
<i>Coordinated Water System Plan</i>	5
<i>Groundwater Management Program</i>	6
AQUIFER RECHARGE AREAS	12
<i>Groundwater Resource and Recharge Protection</i>	12
WATER PLANNING	14

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

ISLAND COUNTY WATER RESOURCES ELEMENT

INTRODUCTION

Island County has proactively achieved a technical understanding of its water resource through numerous studies. Based on this knowledge, a number of water supply and groundwater resource protection and management plans and policies have been adopted and implemented. These elements manage adequacy and protection of the resource through a common goal of non-degradation. A summary of these efforts include:

- 1979–1983 USGS Water Resource Study.
- 1982 EPA Sole Source Aquifer Designation.
- 1985 Designation of Island County as a Critical Water Supply Service Area per 70.116 RCW.
- 1989 Adoption of Island County/State Department of Health Salt Water Intrusion Policy.
- 1990 Adoption of Island County Coordinated Water Plan (CWSP) per 70.116 RCW.
- 1990 Adoption of ICC 13.03A, Water System and Fire Flow Standards.
- 1990 Memorandum of Understanding between Island County and Department of Ecology on Water Resource Planning, Management, and Permitting Activities.
- 1990 September 18, 1990, ICC Chapter 8.09, Potable Water Source and Supply per GMA requirements 19.27 and 58.17 RCW.
- 1991 Adoption of Groundwater Management Program (GWMP) per 90.44 RCW.
- 1992 ICC 8.09 revised to include Critical Recharge Area Requirements pursuant to GMA.
- 1996 Hydrogeologist and data entry staff support hired for monitoring, database development and maintenance, resource management, groundwater evaluations, and development of groundwater flow and sea water intrusion models.
- 1997 Island County and the United States Geological Survey (USGS) cooperative four year Ground Water Recharge Study (1997–2001).
- 2001 Present Watershed Planning – development of a comprehensive countywide water resource plan.

Island County has shown foresight in proactively managing its groundwater resources. In many cases, such as the Sea Water Intrusion Policy and aquifer testing requirements, Island County has lead the State in developing resource evaluation and management policies and has successfully worked to incorporate these policies into agency review of projects involving Island County Resources.

1 The GMA water adequacy requirement for building permits and subdivisions was adopted in
2 Island County a mere 11 weeks after GMA became effective. Current programs are being
3 implemented without grant funding thereby showing the

4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

1 commitment of integration of resource management and protection in land use development
2 review and decision making.

3 The existing water quality and water level monitoring program, comprehensive groundwater
4 database, and construction of groundwater flow and sea water intrusion models provides the best
5 available data for determining adequacy and detecting trends in groundwater quality and
6 availability. All of these integrated programs provide the technical basis for determining future
7 groundwater capacity and future land use development prior to project approval.

8 **WATER SUPPLY AND WATER RESOURCE MANAGEMENT REQUIREMENTS AND** 9 **ACTIVITIES**

10 ***Water Supply Overview***

11 In 1979, Island County contracted with the USGS to conduct a water resource study. This
12 four year study set out to: define the hydrogeology of the Islands; determine the chemical
13 quality of groundwater; and identify areas of existing and potential sea water intrusion. This
14 study has provided detailed information on the hydrogeology of Island County and has been
15 utilized in numerous subsequent studies.

16 In 1982, the Environmental Protection Agency (“EPA”) declared Island County a Sole
17 Source Aquifer. The designation acknowledged the County’s reliance on groundwater as a
18 potable water source and requires federally funded projects be designed to ensure protection
19 of groundwater resources. The County is in fact served by a multiple aquifer system. The
20 sole source designation refers to the County’s reliance on groundwater for drinking water
21 rather than a singular aquifer.

22 Island County’s “sole source” aquifer system is the critically important water supply for
23 people living outside the general Oak Harbor area. Approximately 72% of the county’s
population relies upon groundwater as a potable water resource. Population growth in rural
areas has increased groundwater demand proportionally; this is expected to continue in the
future. Studies completed to date, including hydrogeologic investigations conducted by local,
state and federal agencies, conclude that groundwater supplies are a finite resource in Island
County.

Many of the developed coastal and peninsular regions of Island County are experiencing
degrees of seawater intrusion. The Island County Health Department compiles water quality
data to monitor seawater intrusion and regularly updates a map that delineates these intrusion
regions.

The City of Oak Harbor operates the largest municipal water supply system in Island County.
The primary source of supply for Oak Harbor is from Anacortes through two parallel pipe-
lines. The pipelines are owned by Oak Harbor and supply the U.S. Naval Air Station as well
as Oak Harbor. All other residents in the County are dependent upon groundwater for their
source of water supply.

1 **Coordinated Water System Plan**

2 In 1985, the Board of Island County Commissioners declared Island County a Critical Water
3 Supply Service Area, pursuant to RCW 70.116. This declaration was based on an assessment
4 that identified water supply problems related to uncoordinated planning, inadequate water
5 quantity, or unreliable service existing throughout the County. A Coordinated Water System
6 Plan (CWSP) was completed in 1990, addressing water quantity/quality problems. This plan
7 includes several management options to be implemented by the County's public water
8 systems. The major elements of the plan include a Utility Service Review Procedure and
9 Conservation and Minimum Design Standards. Highlights of these requirements are outlined
10 below:

11 **Utility Service Review Procedure**

- 12 • Prior to new water system development, an applicant must attempt to obtain water
13 service from neighboring purveyors.
- 14 • New and expanding systems must prepare a water plan that evaluates the existing
15 system, needed improvements and future needs.

16 **Conservation**

17 Water conservation requirements for new water systems include:

- 18 • Installation of meters at individual connections and the well source.
- 19 • Implementation of rate structures that encourage water conservation.
- 20 • Development of a leak detection and repair programs.
- 21 • Development of water use restriction procedures for drought periods.

22 **Design Standards**

23 On July 9, 1990, the Board of Island County Commissioners adopted Chapter 13.03A
24 ICC, Water System and Fireflow Standards. Chapter 13.03A ICC establishes criteria for
25 the design and construction of public water systems within Island County. The ordinance
26 is supplemental to other federal, state, and local criteria governing the construction and
27 operation of public water systems and also complies with design standards set forth in the
28 CWSP. This code includes requirements for resource protection, monitoring and
29 management such as:

- 30 • Metering at the well head.
- 31 • Metering individual connections.
- 32 • Water level device installed in the well for water level measurements.

33 To date, the CWSP has not prevented the proliferation of small, independent water
34 systems. The inter-connection of water systems and development of larger water systems
35 with superior technical expertise and facilities has met with marginal success. Due to

1 Island County's rural nature and historical development patterns, many small, scattered
2 developments do not fit the CWSP's goals to encourage the formation or expansion of
3 fewer but larger, well-managed systems (rather than establish small, poorly staffed or
unmanaged systems). Implementing the anti-sprawl strategies of the Comprehensive Plan
will greatly assist in coordinating management of water systems.

4 Development demands pose many challenges to available water supplies. Sufficient
5 quantities of potable water are needed to support existing users and any increased
6 population. There is a continuing need for improvements to domestic water systems and
7 increased water conservation efforts. Many small water systems and community
8 associations now provide most of the domestic water to Island County residents, while
9 individual wells serve approximately 7% of the County's population. Often small water
10 systems and community associations are not adequate to serve an expanding population.
Many older systems were undersized to begin with, and some are inadequate for their
existing service area. Extensive alterations will be required, including improvements to
distribution systems, water supplies and storage capacities, and fire protection facilities.
Federal requirements for water quality monitoring will place additional burdens on many
small systems. Consolidation of water districts and associations is desirable to provide
adequate improvements for delivering public water supplies at the least possible cost to
consumers.

11 Avoiding additional seawater intrusion and other potential groundwater quantity and
12 quality problems depends on careful management of existing finite groundwater
13 resources. The County should encourage the development of alternative management
strategies to make the adequate improvements for delivering safe and reliable public
water supplies at the least possible cost to consumers.

14 The County should encourage development of alternative management strategies to make
15 the most efficient use of limited groundwater supplies. Hydrogeologic investigation and
16 data collection must continue to better predict groundwater availability, as should
investigation of potential mainland water sources, when warranted. As indicated
elsewhere, clustering and limiting impervious surfaces will maintain infiltration, which is
the sole source of the county's groundwater.

Groundwater Management Program

18 In 1992, the Ground Water Management Program (GWMP) was completed, pursuant to
19 RCW 90.44, and adopted as an element of the Island County Comprehensive Plan. This plan
20 provides water resource management options to protect groundwater in Island County.
Changes in health regulations (Chapter 8.09 ICC) to implement portions of the GWMP and
implementation of non-regulatory programs followed adoption of the GWMP. Major
elements implemented by the Island County Health Department include the following:

Conservation Program Option Paper #3

22 A number of conservation measures have been adopted and are implemented in design
23 review and water supply approvals. Pursuant to ICC 13.03, and ICC 8.09, all new

1 drinking water wells drilled in the county are required to be metered whether they are
2 public water supplies or single-family individual wells. For individual wells serving one
3 single-family residence, verification of metering is required prior to approval of a Water
4 Availability Verification Form and issuance of a building permit. For public systems,
5 both source and individual connection meters are required on new and expanding
6 systems. Use-based rate structures promoting conservation and other conservation
7 practices are implemented through the approval of the required water system operation
8 and maintenance agreements. The Island County Salt Water Intrusion Policy also
9 requires the adoption of additional conservation requirements in medium and high-risk
10 areas of seawater intrusion.

6 **Ground Water Monitoring and Evaluation**

7 **Data Collection and Management Program Option Paper #5**

8 **1. Well Inventory.**

9 Well logs either on record with the Island County Health Department or available
10 through the Department of Ecology have been entered into the hydrogeologic
11 database. All new public and individual wells are approved by the Health Department
12 for siting criteria.

11 **2. Water Level Monitoring.**

12 A. Water systems in high and medium risk areas require water level monitoring in
13 April and August of each year and the results are sent to the Island County Health
14 Department and/or Department of Ecology. The Island County Health
15 Department has incorporated this data into their hydrogeologic database.

16 B. Water levels are monitored biannually during water sample collection of the 60 +
17 wells in the monitoring network managed by the County Hydrogeologist.

18 C. Water level electronic measuring tapes are available to the public and can be
19 checked out for use from the Island County Health Department Coupeville office.

17 **3. Water Quality Monitoring.**

18 A. The eight well monitoring network started in 1986 by the Island County Health
19 Department was expanded in 1992 to 20 wells and in 1993 to 40 wells. The wells
20 are monitored in April and August of each year. The current well monitoring
21 program managed by the County Hydrogeologist includes the 40 wells and
22 variable area specific monitoring of up to 60 wells. The Island County Health
23 Department is incorporating this data into their hydrogeologic database.

24 B. Routine water quality sampling is required by public water systems. In addition,
25 conditions of approval in medium and high-risk areas for public wells include
26 additional sampling for chloride and conductivity in April and August and
27 reporting to the Island County Health Department.

- 1 C. Water quality results are currently entered into the hydrogeologic database that is
equipped with numerous geochemical analysis tools.
- 2 D. Single family individual wells are required to monitor for water quality prior to
the approval of building permits (per ICC 8.09).
- 3 E. Numerous wells are monitored on a quarterly basis by the Island County Health
4 Department at the closed Coupeville Solid Waste Landfills. Results are tracked to
identify any statistically significant trends in degradation of ground water quality.
- 5 F. In 1997 The Island County Health Department completed a 1-year nitrate study to
6 determine the spatial extent of nitrate contamination in Island County
7 groundwater. Eighty-three wells were sampled and a report was prepared
discussing the extent of nitrate contamination and proposed remediation
measures.
- 8 G. In 1996, the Island County Health Department worked closely with the
9 Department of Ecology on a one-year well monitoring program. Forty-six wells
were sampled to understand the seasonal fluctuation of chloride concentrations in
areas affected by seawater intrusion.
- 10 H. The Island County Health Department conducted the baseline water quality, water
11 flow, and sediment sampling for both the North Whidbey and Central/South
Whidbey Watershed Water Quality Programs. The final reports were completed
12 in April 1998 and January 2001, respectively, and will be used to identify and
prioritize surface water quality problems for use in the watershed action plan.

13 **Ground Water-Availability. Criteria Option Paper #7**

14 ICC 8.09 was adopted in September 1990. The provisions of this code constitute
15 minimum requirements of the Island County Health Department governing potable water
source and supply and protection of groundwater resources. The elements of this code are
16 outlined elsewhere in this section in more detail.

17 **Ground Water Recharge Option Papers #8 and #9**

18 Critical Recharge Area Protection was incorporated into ICC 8.09 in 1992. All projects
with the potential for groundwater contamination shall be evaluated by the Island County
19 Health Department to determine their impacts on the groundwater resource. Highlights
and amendments to this code including Critical Recharge Area Protection are documented
in more detail elsewhere in this section.

20 A four (4) year Groundwater Recharge Study was initiated in February 1997 through a
21 cooperative agreement and funding of the Board of Island County Commissioners and the
USGS. More detail on the study is provided in the Groundwater Recharge Section.

22

23

Pollution Source Controls Option Paper #18

The objective identified in the GWMP was to establish Best Management Practices (BMPs) to reduce the potential for groundwater contamination from specific activities or

1 facilities. ICC 8.09.097, Critical Recharge Area Protection, establishes a method by
2 which land use proposals are reviewed to determine the potential for groundwater
3 contamination. The Island County Health Department has developed a list of accepted
4 BMPs that are both disseminated to the public and applied as “conditions of approval” on
5 land use approvals. The Island County Health Officer has the discretion to impose
6 conditions designed to prevent degradation of groundwater quality or quantity.

7 Other elements of the GWMP have been implemented by the Island County Health
8 Department on an ongoing basis such as technical assistance and public education.

9 **ICC 8.09 Potable Water Source and Supply**

10 ICC 8.09 was adopted in September, 1990. The provisions of this Chapter constitute
11 minimum requirements of the Island County Health Department governing potable water
12 source and supply, and protection of groundwater resources. The regulations apply to all
13 potable water supply systems proposed to be used for building permits and subdivisions.
14 ICC 8.09 complies with GMA requirements for verification of water availability and
15 adequacy requirements for building permits and subdivisions (RCW 19.27 and RCW
16 58.17). In 1992, this code was revised to include Groundwater Resource Protection
17 measures and Critical Recharge Area Protection measures which also comply with GMA
18 requirements. Amendments to the Critical Aquifer Recharge Area Protection are included
19 in this update based upon the data derived from the USGS Recharge study and the
20 Watershed Planning process currently underway.

21 The following provides a brief overview of the code.

22 **Building Permit and Subdivision Requirements:**

23 Prior to building permit approval, evidence of an adequate water supply must be
provided.

This code includes requirements for single-family individual wells, including a meter at
the wellhead and the establishment of a 100-foot pollution control radius. These
conditions exceed state requirements for individual water supply approvals. In addition,
other requirements for individual well approvals include: drilling records, water quality
testing and pump testing.

Requirements for public water supply approvals are also more stringent than state
requirements. In addition to meeting WAC 246-290 and WAC 246-291, approvals in
Island County require compliance with the Island County Coordinated Water System
Plan, the State Department of Health and Island County Seawater Intrusion Policy, and
ICC 13.03A including metering, conservation and aquifer testing.

ICC 8.09 also includes requirements on proposed subdivisions assuring water availability
prior to the creation of new lots or other land use approvals requiring potable water.
These requirements include aquifer tests and other detailed hydrogeologic evaluations
when deemed necessary.

ICC 8.09.099, formerly 9.09.097, Critical Recharge Area Protection Requirements establish a method by which land use proposals are reviewed to determine the potential for groundwater contamination. Critical Recharge Areas

1 have been identified utilizing the “Guidance Document for the Establishment of CARA
2 Ordinances”, Department of Ecology, 2000.

3 A hydrogeologic site evaluation is required prior to approval of projects identified by the
4 Health Officer as having the potential for groundwater contamination. Conditions may be
5 imposed to prevent degradation of groundwater quality and quantity. BMPs have been
6 adopted for activities where accepted BMPs are available. Project approvals are based on
7 the conditions and/or mitigation plan required by the Island County Health Officer.

8 **Other Ground and Surface Water Protection Standards**

9 ICC 8.07C On-Site Sewage Systems The goal of groundwater and surface water quality
10 protection is reflected throughout ICC 8.07C. Requirements for sewage system vertical
11 separation to groundwater and horizontal separation to surface water exceed the state
12 standards outlined in WAC 246-272.

13 **Island County Hydrogeologist**

14 The Board of Island County Commissioners hired a Hydrogeologist and data entry person
15 in January of 1996. The Hydrogeologist works in the Health Department and current
16 Hydrogeologist activities are described below.

- 17 • Detailed data collection, analysis, and mapping of aquifer distribution, aquifer
18 characteristics and geochemistry.
- 19 • Construction and calibration of numeric three-dimensional groundwater flow /
20 seawater intrusion models.

21 Groundwater flow models allow for the development of an understanding of regional
22 water balance issues and the impacts that land use, groundwater withdrawals, and
23 climatic variations have on the groundwater system. The results of these efforts are
utilized for both application specific reviews, and long term planning efforts.
Modeling efforts are concentrated in areas that are experiencing a combination of
projected population growth and seawater intrusion problems. This is a long-term
effort with individual studies and models expected to take several years each.

- Groundwater monitoring including a county-wide network of 60 wells that includes
water sampling and water level monitoring. Up to 40 additional wells are monitored
in area specific studies. Recent activities associated with the county’s Watershed
Planning efforts also included the collection of water quality samples and
groundwater elevation determinations from 378 groundwater wells.

The network will be increased in size (number of wells) and detail (parameters tested)
to better assess any trends in water levels or water quality with a projected maximum
of 100 wells (excluding area specific studies).

- Review of projects that may impact groundwater resources per ICC 8.09.099.

1 The decision making process will utilize data collected specific to the proposal,
2 regional hydrogeologic and geochemical analysis, and regional groundwater flow
models as they become available.

- 3 • Data management and the continued development of a hydrogeologic database.

4 These tools greatly increase our ability to analyze regional and area-specific trends in
5 water quantity or quality. Through these efforts it is possible to detect and mitigate
6 problems related to resource management before these problems become critical.

- 7 • Technical staff to the Watershed Planning process.
- 8 • Public outreach and education.

9 **Watershed Planning**

10 Since 2000 Island County has been involved in the development of a Watershed
11 Management Plan pursuant to RCW 90.82. Phase II of the watershed plan development
12 included a comprehensive assessment of the groundwater systems supplying potable
13 water for the majority of the population. 379 wells were sampled for water chemistry and
14 water level elevation. This data was is being used for the development of the plan in an
15 attempt to define those locations within the county where ample water supplies exist and
16 those areas where the groundwater supply is tenuous.

17 **Seawater Intrusion**

18 The Island County Health Department and State Department of Health adopted a joint
19 Seawater Intrusion policy in 1989. The purpose of the policy was to responsibly manage
20 the approval of new public water systems (two or more connections) as well as classify
21 and monitor existing or expanding public water systems with respect to seawater
22 intrusion. Through the implementation of this policy, problems of the degradation of
23 drinking water quality or loss of water source due to seawater intrusion are reduced or
eliminated.

This policy established three (3) risk categories of saltwater intrusion risk for all public
water systems that exist, or are expanding, or are proposed to be used as a drinking-water
source. This policy further establishes standard requirements for water systems within
each risk category.

The Watershed Planning process provided an opportunity to review the county's
methodology for evaluating groundwater withdrawals in areas defined at risk for seawater
intrusion. An outcome of the planning process, based upon data collection and analysis of
378 wells, was the development of a new evaluation tool that focuses on both
groundwater chemistry in the form of chlorides and elevation of the aquifer in reference
to sea level in order to predict impacts to the resource. This new methodology is included
as an update to the county's CAO for the protection of groundwater resources and is
described in detail under the Aquifer Recharge Area protection section.

1
2
3
4
5
6
7
8
9
10 **Water Related Interested Parties**

11 The citizens in Island County have shown a great deal of interest and support in water
12 related issues. The following organized groups actively support resource management
efforts and advise the Board of Commissioners on water related matters:

- 13
 - Water Resource Advisory Committee (WRAC)
 - 14 • Community Health Advisory Board (CHAB)
 - 15 • Environmental Health Advisory Board (EHAT)

16 ***AQUIFER RECHARGE AREAS***

17 ***Groundwater Resource and Recharge Protection***

18 The Growth Management Act (“GMA”) requires the designation and protection of critical
19 areas, such as aquifer recharge areas. Included in the adopted GWMP are areas identified as
20 having a greater potential for recharge based upon soil type and surficial hydrology. In 1992,
ICC 8.09 was amended to include measures to protect groundwater from surface activities in
susceptible areas. All of Island County was considered a recharge area and specific protection
measures were determined at the time of application and related to project impacts.

21 The amendments to Chapter 8.09 ICC in 1992 were based upon the entire county as a critical
22 recharge area formulated from the sole source aquifer designation and adopted groundwater
management areas pursuant to Chapter 90.44 RCW. The criteria established in Chapter 8.09
ICC provided the basis for the protection of groundwater resources in critical recharge areas.

1 As noted above, the 2002 USGS Recharge Study provided Island County with invaluable
2 information concerning the local conditions that affect the recharge of precipitation into our
3 aquifer systems. Previously, these areas had not been specifically delineated other than
4 through the application of potential recharge rates based upon superficial geology. In the
5 previous Water Resources Element of the Comprehensive plan it was noted that the
6 information derived from the recharge study would be used to update or further identify those
7 areas of the county that are critical in terms of groundwater recharge and aquifer
8 susceptibility.

9 Through the Watershed Planning process Critical Aquifer Recharge Areas have been
10 delineated using the “Guidance Document for the Establishment of CARA Ordinances”,
11 Department of Ecology, 2000. The following four criteria were used to assess aquifer
12 vulnerability, and maps of each parameter were developed.

- 13 1. Depth-to-Water parameter was used to develop the “Depth to Water Susceptibility
14 Rating” map, using data from the Island County hydrogeology database;
- 15 2. Recharge parameter was used to develop the “Groundwater Recharge Rate” map,
16 using information from the USGS Deep Percolation Model and DOE Scoring
17 Options;
- 18 3. Soil Permeability parameter was used to develop the “Soil Percolation Rate” map,
19 using information from the Island County Soil Survey; and
- 20 4. Surficial Geology parameter was used to develop the “Surficial Geology
21 Susceptibility Rating” map, using data from the Island County hydrogeology
22 database.

23 The Critical Aquifer Recharge Area Map shows the sum of the scores from the four
individual maps and ranks the county into one of three zones: “limited,” “moderate,” and
“high” risk for contamination. The specific risk associated with surface contaminants, then, is
based upon the four criteria rather than just surficial geology as in the past. Project actions in
areas identified as having an increased risk for groundwater contamination may require a
hydrogeologic assessment, as determined by ICC 8.09.

Hydrogeologic evaluations are required prior to approval of projects identified by the Health
Officer as having a potential for groundwater contamination. Appropriate mitigation
measures are imposed as conditions of approval for projects with a potential for impacts to
groundwater resources.

Pursuant to the ICC 8.09, Best Management Practices (“BMPs”) have been adopted as part of
ICC 8.09.097.C, Critical Aquifer Recharge Area Requirements, for projects which have a
potential for groundwater contamination. BMPs are applied as conditions of approval for
land-use projects in Island County.

Due to the complexity of the aquifer systems underlying Island County, it is difficult, if not
impossible, to apply regional determinations of groundwater resource protection and water
availability. Given these management limitations, site-specific, project specific evaluations
are the best available option. As additional information is collected and analyzed,

1 refinements can be made to the system of identifying critical areas for recharge and
2 groundwater protection.

3 **SEAWATER INTRUSION PROTECTION**

4
5 Over ten years of experience in the application of the Saltwater Intrusion Policy has shed
6 light on some limitations of the policy. The first limitation is that there are other sources of
7 chloride in the environment other than seawater intrusion. Non-intrusion chloride sources
8 include: connate (very old) groundwater, septic system effluent, very hard groundwater,
9 windblown sea spray, and recharge from irrigation, agricultural practices, and well
disinfection. Chloride from any of these sources can result in elevated levels of chloride
concentrations in an aquifer, triggering the Saltwater Intrusion Policy when in fact the aquifer
is not intruded. This erroneous interpretation of data is known as a false positive, where a test
identifies a problem that does not in fact exist.

10 False positives are one potential problem for the Saltwater Intrusion Policy; a second
11 involves the opposite effect, a false negative. False negatives occur when a test indicates a
12 problem does not exist, when in fact it does. The processes of groundwater recharge, flow,
13 mixing, and discharge all combine to affect the movement of marine water inland into an
aquifer. Only after the marine water influences well water quality do the existing aquifer
protection standards apply. The existing tools utilized for protection do not take into account
the identification of future problems through predictive strategies.

14 In order to prevent seawater from entering a freshwater aquifer, adequate freshwater pressure
15 must be maintained. An aquifer's susceptibility for seawater intrusion can be evaluated by
16 measuring the distribution of water level elevations. Thus, the relationship between an
17 aquifer's water level elevation and its susceptibility to seawater intrusion can be utilized as a
planning and resource management tool. If employed in the same manner as the current
Seawater Intrusion Policy, as a method of flagging a proposal for more detailed review, it
may overcome virtually all of the policy's current limitations.

18 An aquifer that has water level elevations (pressure) significantly above sea level is not at
19 risk for seawater intrusion, while an aquifer that has near sea level water levels is at risk. A
20 more sophisticated analysis would be required to answer the question of whether or not the
low-pressure aquifer would actually intrude due to a proposed withdrawal, but the risk for
intrusion is definitely present. If aquifer water level elevations can be accurately determined,
incorrectly identifying an area as being at risk for intrusion (false positives) should not occur.

21 Through the Watershed Planning effort Island County and the WRAC collected and analyzed
22 water quality and groundwater elevation data for 378 wells. This information was used to
23 develop countywide water level elevation criteria to define at what elevation is a well at risk
to seawater intrusion. These elevations, coupled with chloride data, were then used to define

1 risk categories for the purpose of reviewing land-use proposals to define impact to the
2 resource.

3 Hydrogeologic evaluations are required prior to approval of projects identified by the Health
4 Officer as having a potential for causing, inducing, or contributing to seawater intrusion (ICC
5 8.09.099). Appropriate mitigation measures are imposed as conditions of approval for
6 projects with a potential for impacts to groundwater resources. Additionally, public water
7 systems are required to collect groundwater chemistry and water level elevations in areas
8 defined as being at increased risks to intrusion.
9
10
11
12
13
14

15 **Goals:**

16 **To manage and protect ground water withdrawals and provide for resource
17 protection through a common goal of non-degradation for existing and future
18 residents of Island County.**

19 **To protect aquifer recharge areas from contamination and insure long-term
20 recharge potential.**

21 **Policies:**

22 **A. Continue efforts to identify areas with ground water problems such as seawater
23 intrusion, groundwater depletion, and contamination from surface activities.**

1. Continue implementing data collection and analysis efforts as recommended in
the Ground Water Management Program.

2. Work with the Island County Health Department, Washington Departments of
Health and Ecology to make best use of available data and new technology.

3. Use site-specific data as it becomes available to determine locations of important recharge areas, areas of limited ground water availability, and areas of particular vulnerability to contamination from surface activities. Maintain, update, and coordinate this data to make the most effective use of the available information.
- B. Protect the quantity and quality of groundwater resources for existing and future residents of Island County.
 1. Provide incentive programs to encourage participation in water conservation and aquifer recharge area protection programs.
 2. Consider acquisition of areas with particular value to ground water recharge.
 3. Continue participation with State agencies and with the public in developing, updating, and implementing tools to improve management of limited ground water resources such as the Coordinated Water System Plan, the Ground Water Management Program, and the Watershed Management Plan.
 4. Development must not be allowed to outstrip known water supplies. Consideration shall be given to the availability, susceptibility, and vulnerability of known ground water resources when siting new development and making land use decisions, per ICC 8.09 and related policies.
 5. No intensive development shall be allowed in areas of known ground water limitations as determined by the Health Department, unless it can be proven through objective well tests not to diminish water supplies or reduce water quality for existing users, per ICC 8.09 and related policies.
 6. Continue to provide for adequate groundwater analysis, commensurate to the scale and nature of the proposed development.
 7. Continue to carefully evaluate the hydrogeologic setting when making decisions on potentially contaminating land uses, and require use of Best Management Practices, hazardous material management plans, and other tools to help prevent contamination of ground water.
- C. Maps, site-specific studies, and information collected by other agencies available for public review will be made readily accessible to potential and existing landowners, interested citizens, and development interests to aid in the protection of these areas.
- D. Development regulations shall be implemented in addition to those associated with the underlying land use designation.

WATER PLANNING

Goal:

Ensure that Island County plans and develops in a manner that utilizes the best available information regarding water resources, so that the resource will be preserved for current and future use.

Policies:

- A. Island County will prohibit service overlaps for the expansion of existing water systems and the formation of new water systems per CWSP.
- B. New water systems will be required to meter and document water usage at the source and impose conservation strategies and implementation measures per CWSP.
- C. Water systems will be encouraged to upgrade facilities to provide adequate water distribution, pressure, storage, and treatment for domestic use and fire protection.
- D. The County will promote the retention and reuse of stormwater when it is the best and environmentally correct option.
- E. Watershed management planning will be cognizant of the need to preserve water supply while providing drainage facilities to protect the welfare and safety of the community.
- F. Development plans will contain plans for facilities to mitigate the impacts of increased runoff, storm water drainage and flooding.
- G. Public education concerning water conservation will be a continuing high priority.
- H. The location and design of development will be carefully guided in order to minimize potential adverse impacts on the quality of ground and surface waters.
- I. Land use patterns and practices conserving the integrity of the natural watershed system will be encouraged.
- J. Development will be restricted unless adequate water supplies are available per ICC 8.09 and related policies.
- K. Prior to any final plat approval, water availability must be reviewed and approved in accordance with ICC 8.09 and other related water policies.
- L. Reuse of water, recharge of aquifers and alternative storage systems will be encouraged.
- M. Incentives will be offered for the retrofit of existing fixtures with water conservation fixtures.

(Ord. C-83-05 [PLG-011-05], July 25, 2005)